IOWA STATE HIGHWAY COMMISSION

TRAFFIC AND HIGHWAY PLANNING

June, 1963

SUBJECT: THE EFFECT OF THE NO-PASSING ZONE SIGN ON "PASSING" ACCIDENTS

The No Passing Zone sign (W10-4) was designed in 1958 for the purpose of informing the driver contemplating a passing maneuver of hazardous sight conditions ahead. This warning sign, of pennent shape design, was placed on the left side of the road so as to be more conspicuous to the intended driver. During the two year period 1959-1960, the W10-4 signs were erected throughout the Iowa Primary Road System.

In order to study the effect, if any, of the W10-4 sign on the passing habits of drivers, an analysis was suggested to compare the number of "passing" accidents before and during sign erection (1956 thru 1960) against after sign erection (1961 thru 1962). The data, for the analysis, consisted of accidents involving two moving motor vehicles going in opposite directions (called "passing" accidents) were obtained from the Iowa Department of Public Safety for the (rural) primary system. These data were used since it was assumed that extra safety precautions at "no-passing" zones would reduce head-on collisions. This assumption while not completely true, is justified, since, in the main, most "passing" accidents are in this category.

To study any change in "passing" accidents, according to the above assumption, the data shown in Table 1 were analysed.

After minimal study of total accident data, it becomes obvious that column (3) is a sub-function of column (2); therefore, it was necessary to remove "passing" accidents from the total accidents

TABLE 1
PRIMARY RURAL ACCIDENT DATA - FROM IOWA DEPARTMENT OF PUBLIC SAFETY
(1956-1962)

	Year*	Vehicle Miles of Travel (v.m.) -in Millions- (1)	Total Number of Rural Primary Accidents -all types- (2)	Total Number of "Passing" Accidents (3)	Total Number of "Non-Passing" Accidents (2)-(3)=(4)	"Passing" Accidents per Million v.m. (3)÷(1)=(5)	"Non-Passing" Accidents per Million v.m. (4)÷(1)=(6)
Prior	1956	4717	9904	2342	7562	0.4965	1.6031
	1957	4802	9715	2285	7430	0.4758	1.5473
	1958	4887	9146	1963	7183	0.4017	1.4698
During	1959	4973	11780	2640	9140	0.5309	1.8379
	1960	5058	11280	2365	8915	0.4676	1.7626
After	1961	5143	9424	1967	7457	0.3825	1.4499
	1962	5228	8630	1982	6648	0.3791	1.2716
	TOTAL	34808	69879	15544	54335		

*Prior to 1956, rural primary "passing" accidents were not given in a seperate category.

so that independence could be established between the two groups, i.e., "passing" and non-passing" accidents. These accident groups were further corrected to number of accidents per million vehicle miles traveled, columns (5) and (6).

Upon reviewing Table 1, one readily sees the trend towards the reduction of "passing" accidents. The primary question becomes, "was there a significant difference of 'passing' accidents after the erection of the W10-4 sign?" To study this, a "t" test was run to compare the years 1956 thru 1960 and 1961 thru 1962. Using column (5) a t-value of 2.8138 was obtained, $t_{.05,5}=2.571$ showing a significant reduction, at the 5 percent level, of "passing" accidents. To confirm this, a second question was asked, "was this reduction due to a reduction of accidents in general?" To study this, a second "t" test was run to compare the same two sub-groups of years in regards to "non-passing" accidents, column (6). The t-value obtained was 2.3127 ($t_{.05,5}=2.571$ which shows that there was no significant reduction of "non-passing" accidents over the same two periods of study. This implies that there was a significant reduction of "passing" accidents, while "non-passing" accidents remained constant. This reduction suggests the W10-4 signal is a safety feature.

To determine the percent reduction the means of both periods were used, showing a 19.75 percent reduction in "passing" accidents after the erection of the W10-4 (No-Passing Zone) sign.

One may question the sample sizes used for such a study or the use of assumed data to make the comparison. To the former question, there is but one answer - continued data will be collected in future years, since the sign has been in use only a short period of time. To the latter question, more detailed

reporting is necessary to study "passing" accidents, not only in Iowa, but in all states.